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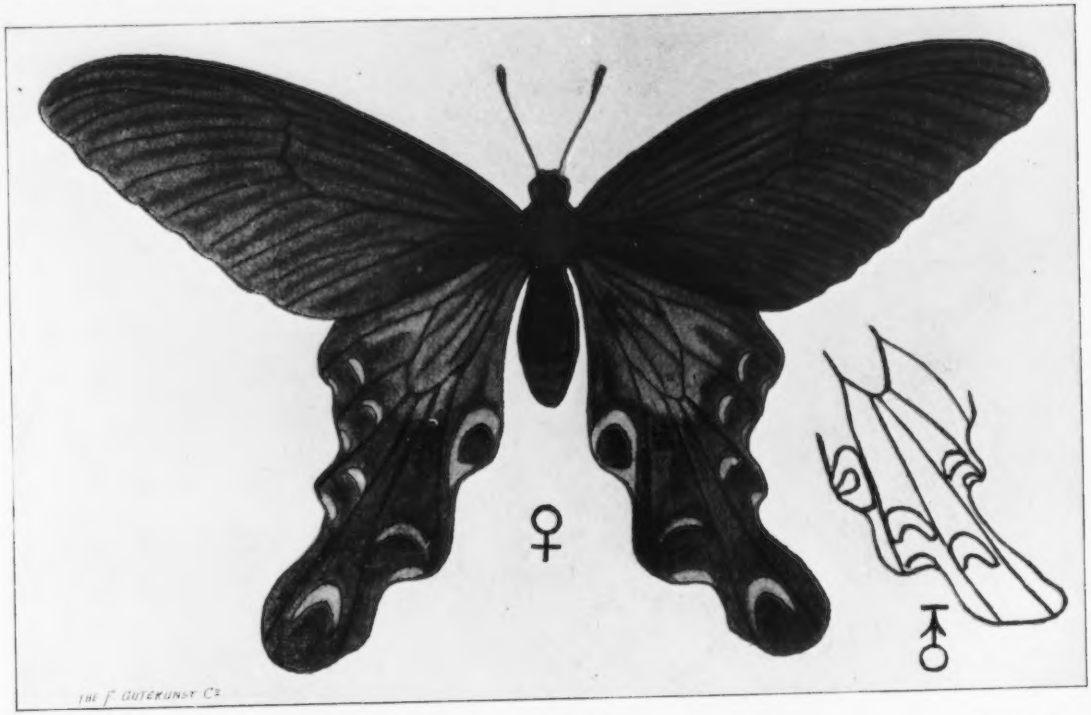

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COLLECTING ON MT. WASHINGTON.—Part I.

By ANNIE TRUMBULL SLOSSON.

I went up the mountain for the first time this season in the afternoon of July 7th. The day had been hot and still below and even on the summit the sunshine had been bright and warm and there had been little wind. As soon as we left the cars I went at once to my old hunting ground, the warm wooden front of the Summit House. This is painted white, and on a clear day has the sunshine upon it from morning till late afternoon. And on the warm white surface, insects of all orders collect, setting and remaining and easily taken. Here I once found and captured, on July 4th, three or four years ago, at the close of a warm bright day, twelve specimens of *Alypia langtonii*. These were resting, not far apart, on the front of the house and formed a sort of Sorosis or Woman's Club, for they were all females with the one white spot on secondaries. I felt sure of a good catch now, and was not disappointed. There were so many insects either in full view or hidden away under the projecting clapboards that I was kept busy for some minutes, and literally had my hands

full. I was not without aid however. I had with me a quick-eyed and quick-fingered friend, and a stranger seeing us at work offered his assistance, and proved a useful ally. Of course he proved to be a naturalist, a botanist from Boston, an enthusiast as to his own specialty, and a sympathising listener to the riders of other hobby horses. In less than half an hour we had taken fifty-nine insects,—Coleoptera, Hymenoptera, Diptera, Hemiptera and Lepidoptera. Of this last order, my own specialty, we found but one specimen. Oddly enough, this was one of the Ægeridadæ, *Albuna torva* Hy. Edw. This was first described from specimens taken in "Glen, Mt. Washington, N. H., Vancouver Island and Colorado," by Mr. Henry Edwards, "Papilio" vol. i, p. 189. I have taken several specimens at Franconia.

But it seemed a strange insect to find on the very summit, resting on the side of the house, in perfect condition, not a scale removed from delicate body and fragile wings. The brilliant beetle, *Corymbites resplendens* shone out like an opal from the white background. We took some half dozen of this species at that time, and certainly more than fifty during my stay of a week. It is always plentiful on and near the summit. *Corymbites virens*. *C. hieroglyphica* and *C. cruciatus*, were also taken, and soon I spied that rare cerambycid, *Anthophilax attenuata*, hiding away in the shadow. It was a fine female specimen. I have taken one of the same sex at Franconia several years ago, and another this Summer. I knew that the male was exceedingly rare, and was therefore overjoyed to secure one a few minutes later. Then another male turned up, and soon another female. The next day I found another pair, also near the house, making three good pairs in all, a rare capture. Of Hymenoptera I took three specimens of *Xiphydria provancheri* Cress., one of the Uroceridæ. I have taken it previously on the mountain. There were several Ichneumons, a brilliant little Chrysid and a Bombus. Of Diptera there were several varieties, among them two pairs of the large robber-fly, *Laphria sericea*, and Hemiptera was represented by two or three leaf hoppers.

We went in to supper, hungry and happy, bottles were filled with rarities and our heart's with hope. There is no night collecting on the summit. I have been there a great many times in all sorts of weather, but have never seen an insect fly after dark, though I have watched the lights and windows faithfully. But

our evenings at the Summit House are very pleasant ones, especially when, as happened this time, there are several of congenial tastes and pursuits. By a happy chance there were six of us this time, all enthusiasts in our lines. Two were botanists, the Boston one who had aided me, on my arrival, in what might be called my house hunting, and another also from Massachusetts, and just now devoted to the Sphagnaceæ. This last, for lack of a better title, we styled the sphagnostic. Then there were two zoologists at this time looking up certain small rodents with unpronounceable names. These last scattered their little wire traps all over the grand old mountain, and so we dubbed them the trappists.

The weather was favorable through most of the week. Of course there was some fog, some wind, and a little rain. But we had intervals of sunshine and clear skies and made use of them, and in that one week, from Friday to Friday, I took about six hundred insects. This far surpasses any record I have ever made here hitherto. But the season had been exceptional, with much warm weather and much less wind than is usual, so I was told. Then I was aided in my collecting by so many willing hands. Every one contributed something. The trappists never went out to set or examine their traps without bringing back some entomological treasure, and the botanists shook out from their tin cases live beetles and bugs they had captured while gathering alpine plants. All the good people of the hotel interested themselves in the matter, and added to my collection hourly. From the managers to the youngest bell-boy all contributed, and even old Med, the grand St. Bernard, sniffed at every fly that buzzed around his massive head and seemed to question its desirability as a specimen. Nearly all my own personal collecting was done upon the very summit, quite near the house. I went once down as far as the "Alpine Garden," but generally spent my day in hunting nearer home. Under stones all over the cone were three or four species of Carabidæ in great numbers. Here I found *Pterostichus vindicatus*, *P. coracinus*, *Amara hyperborea*, a *Patrobus*, probably *rugicollis*, and *Nebria sahlbergii*.

In Austin's list of 1874 he calls *Amara hyperborea* "decidedly the most abundant species under stones." I have never found it so, and this season took but three or four specimens in all. *Pterostichus vindicatus* was far the most plentiful of the species I have spoken of. *Patrobus rugicollis* (?) was also common. This

same species I have also taken at Franconia this Summer. Two of the Byrrhidæ, *B. geminatus* and *B. cyclophorus* (?) were not infrequent under stones near the stables, and with them I found *Cryptohypnus ventriculus* and *C. abbreviatus*. Of course the butterfly *Chionobas semidea* was there in numbers, flying about among the rocks, darting down into dark crevices when pursued, or resting on some gray, lichen-covered stone so like in prevailing tint to its own mottled wings, as to defy detection. Of *Argynnis montinus*, the other and much rarer alpine butterfly, I saw nothing on this first trip. Since the time, three or four years ago, when I was so fortunate as to capture seven specimens during the first week of August, I have never expected to find them at an earlier date.

———o———

THE MEETING OF THE ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.

The fifth annual meeting of this Association, held at Madison, Wis., was in some respects the most successful that has been held. In point of attendance it was behind the Washington and Rochester meetings, but in the number and value of the papers presented, it ranks with the best. As the proceedings are to be published in detail in "Insect Life," and an abstract in the "Canadian Entomologist," ii will be necessary to give here only a mere outline of what was done, referring to the other publications for further information. The Presidential address by Prof. S. A. Forbes was a thoughtful review of the work that had been accomplished during the past year, and the plea for greater unity of purpose among entomologists.

Two papers were presented by Mr. J. Ritzema Bos, and were read by the Secaetary, the writer not being present. M. H. Du Buysson sent a paper on the use of Bisulphide of Carbon for the destruction of insects, principally those infesting furs and Museum specimens. The point of this article was in the description of a water-joint to a box described by him, and in which the specimens to be fumigated were to be placed. An interesting discussion ensued on the uses of Bisulphide of Carbon both as a destroyer of Museum pests, and of field insects. Quite a diversity of results appeared, and it is evident that this substance has not yet

been tested in as many directions as is needful, before its usefulness to the economic entomologist can be decided. Mr. T. D. A. Cockerell sent a paper on the distribution of scale insects, and another on a method of keeping slip records. Mr. D. W. Coquillett sent a paper on hydrocyanic acid gas as an insecticide, describing the experiments that had been made with a variety of gases for the destruction of scale insects. Mr. H. Garman read a paper on illustrations for the economic entomologist. He reviewed the various methods now in use, pointing out their merits and defects, and concluding that, after all, wood engraving was, up to the present time, by far the most satisfactory process. There was considerable discussion upon this subject in which the claims of photography as a method of illustration were urged, and some of the difficulties in reproducing from photographs were explained and discussed. Mr. C. R. Gillette read a paper on the use of arsenic and its combination as an insecticide, reviewing in a general way the experiments made with this substance, and discussing the scope of its combinations. This paper was also discussed at some length. Mr. A. D. Hopkins presented a paper on note and record keeping for the economic entomologist, in which he described at length his methods. In the discussion on this paper it eventuated that no two men had precisely the same system, and that each had adopted the method used by him, because of its seeming simplicity as applied to his own work. Another paper on destructive Scolytids and their imported enemy, also started considerable discussion in connection with a paper by Mr. Riley on and parasitic predaceous insects in applied entomology, and another by Mr. J. B. Smith on the economic value of parasites and predaceous insects. The whole matter of the importation of parasites and predaceous insects was fully discussed, and the question of the real substantial value of insects of this character to the agriculturist, was fully considered. The general tendency of opinion seemed to be that the aid given by such insects had been considerably overestimated. Mr. L. O. Howard read a paper on methods of studying the life-histories of injurious insects, in which he detailed at some length some of the contrivances in use in the United States Department of Agriculture, and also read another note on mosquito treatment, in which he gave the results of some further experiments in the use of kerosene for the destruction of the larva of these pests.

Mr. J. A. Lintner sent a paper on arsenical spraying of fruit trees while in blossom, which was in the nature of a report from the committee appointed to consider this subject two or more years ago. Nothing new is added to our absolute knowledge of the subject; but hasty legislation was deprecated, and a list of insects was given for which spraying, while fruits were in blossom, might be necessary. It was intimated that the matter might resolve itself into a clash of interests as between bee-keepers and fruit-growers, and it might be merely a question as to which interest was the most important. Mr. H. Osborn described the methods of combating insects which attack forage plants, some methods of attacking parasites of domestic animals, and also gave a few notes of the year as applied to Iowa. In the discussion ensuing on the second of these papers the value of the kerosene emulsion for the destruction of animal parasites was one of the subjects considered, and there seemed to be a considerable reaction against recommending it for use for this purpose. No question was made as to its value or effectiveness; but it was considered unsafe or inadvisable to recommend it to the general farmer who could not be trusted to properly prepare and use the substance. Mr. J. B. Smith read a paper on the use of fertilizers as a means of lessening insect injury to field crops, and also gave some notes of the year in New Jersey. Considerable discussion ensued on the first of these papers, and it seemed to be the opinion that, however satisfactory the method might be in the Eastern States where fertilizers were a necessity, it would be impossible to secure their use by the farmers of Western States, where the soil required no addition to its natural fertility. Mr. F. M. Webster read a paper on the insect foes to American grain, and also gave notes on the insects of the year in Ohio. In the discussion on the first of these papers considerable was said on the geographic distribution of some of the insects mentioned, and it developed also that in the study of some of the species there are abundant opportunities for co-operation among the workers in a number of States. Mr. H. M. Weed read a paper on remedies for insects injurious to cotton, in which he described the practice at present in use in Mississippi, showing the tendency among farmers to resort to the very simplest and most primitive possible methods. A paper was sent by Mr. R. Allan Wight, of Auckland, New Zealand, on *Icerya purchasi* and *Vedalia cardinalis* in New Zealand. Mr.

C. V. Riley made some remarks on a San José scale, which has made its appearance in Virginia during the present year. He emphasized the fact that here was another case in which an injurious insect could probably be completely stamped out of one locality were there any authority with sufficient power to act promptly and efficiently. This started some discussion as to the value of legislation in matters of this character, and quite a diversity of opinion was shown to exist on the subject. Mr. H. Garman described his method of preserving larvæ for study, which consisted essentially in killing them in boiling water, then cutting through the skin and again boiling until the entire tissues of the insect had become hardened and fixed. Miss M. E. Murtfeldt read some notes on *Piophila casei*, in which she described the attacks made by the larva of this insect on meats in smokehouses.

Altogether six sessions were held on three days, and had there been a longer time for meeting it could have been profitably employed, since in order to allow the reading of all the papers it became necessary in some cases to shorten discussion.—J. B. S.

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On the Larva of Notodonta stragula Grt.

By HARRISON G. DYAR.

The mature larva of this species has been briefly described three times,* but the authors are sadly at variance as to the location of the discal humps on the anterior abdominal segments. Grote locates them on joints 5 and 6, Edwards and Elliot on joints 7 and 8, while Packard finds them on joints 6 and 7. My observations agree with those of Dr. Packard. The other authors are probably in error.

Egg.—Shape two-thirds of a sphere, the base flat; smooth, white, not shining; diameter 1 mm. Magnified 50 diameters it appears closely, but irregularly punctured. Magnified 250 diameters there is seen around the micropyle a row of 12 radiating pyriform cells, followed by two more concentric rows of elongate hexagonal cells. After these the regularity of the rows of cells

* 1882—Grote, Papilio, vol. ii, p. 99.
1883—Edwards and Elliot, Papilio, vol. iii, p. 129.
1890—Packard, Proc. Bost. Soc. Nat. Hist. xxiv, 524.

is lost, the reticulations dividing them become broad, separating a series of rounded, shallow pits, not regularly arranged, but quite close together.

Larva, stage III.—Head narrowing upwardly, with a rather marked angle between front and sides, clypeus rather large, sutures evident, the median depressed at vertex; width 1 mm. Body cylindrical, joint 12 enlarged dorsally, sloping off rapidly to joint 13, which is small; anal feet no larger than the other abdominal ones. On joint 6 dorsally a fleshy hump, low, conical, nutant. A very slight one also on joint 7. Color lilac-white, diffusely marked along the sides with a darker shade. A brown-black dorsal band, narrowing and disappearing on joints 8–10, but distinct again posteriorly. A faint white stigmatal line. Thoracic feet dark. Larva rests on a perch made of the midrib of the leaf.

Stage IV.—Head higher than joint 2, concolorous with body, with a purplish band from antennæ narrowing upwardly to vertex of each lobe, save dark mottlings, especially posteriorly on the sides; width 1.7 mm. Body lilac-white; the darker lateral streaks become oblique subdorsal lines, but are faint, as is the obscure white stigmatal line. Dorsal band continuous, but very narrow on joints 8–10, velvety brown-black on the nutant fleshy hump on joint 6, reddish on the hump on joint 12. Venter heavily shaded with purple-brown; feet all dark. Tubercles small, concolorous, with very fine short setæ. Row i anteriorly, ii posteriorly subdorsal, iii lateral, iv posteriorly substigmatal, v and vi in line subventral. Spiracles black ringed; anal feet white above; a white line from the spiracular line onto the foot of joint 10. The two setæ of row i are borne on the hump of joint 12; but the humps on joints 6 and 7 arise between the tubercles and bear no setæ.

Stage V.—Width of head 2.8 mm. Humps on joints 6 and 7 subequal, leaning backward, retractile, bearing tubercle i at the lateral base; anal feet used in walking, small; stigmatal white line absent on joints 11–13, but bent at right angles on joint 10, passing down along the foot. Otherwise as in the description by Edwards and Elliot.

Food-plants.—Willow (*Salix*) and poplar (*Populus*).

ECONOMIC ENTOMOLOGY AT THE WORLD'S FAIR.

It may interest some of the readers of the NEWS to know what has been done to represent Economic Entomology at Chicago, and to this end a brief statement of the character of the insect collections may not be uninteresting. By all odds the largest, and infinitely the best-arranged and considered, is that in the U. S. Government building under the charge of Dr. Riley. In the first place a great deal of money has been spent upon the collection; the arrangement has been in the hands of trained men, with a definite purpose in view, and the economic exhibit as a whole is extremely good. There is nothing that is not open to criticism, and it would be easy to find fault with some phases of the collection. It is questionable, perhaps, whether there is any necessity for figures when the insects are large enough to represent themselves; as for instance, a *Cecropia* and its cocoon are quite visible enough to the naked eye without figures to assist in recognizing them. It might have been better, or at least looked better in some cases, if the species were represented by a greater number of specimens than is sometimes the case, and there are other little matters of detail with which fault could be found. But the collection is so good as a whole, that criticisms of this character seem mere carpings. In addition to the strictly economic series, there are also a number of boxes containing merely show specimens: that is, attractive specimens, principally from South and Central America, illustrating nothing except themselves, and furnishing what may be termed an "Oh, my!" collection. These are not named and have no scientific interest whatever. Another lot of boxes illustrates the National Museum collection by means of sample drawers from a majority of the orders. It is perhaps a question whether it is good policy to expose any part of a regular museum series, in any order, to the action of light, dust and the risk of accidents necessitated in a case like the present, and it is gratifying to note that types, at least, have been removed from the collection and retained in the Museum. The entomologist will find one of the most interesting parts of this exhibit in the exhibit of apparatus for raising, mounting, studying and capturing insects; a great variety of nets, bottles, forceps, pins, and other paraphernalia being shown.

There is another collection of insects in the government building, forming part of the Smithsonian exhibit; but as this is strictly technical in character, and was prepared by the writer, it needs only a mere mention here, and the criticism must be supplied by some more disinterested party. In this collection all the families of American insects are defined on printed labels, and are illustrated by specimens and drawings.

In the Agricultural Building there are a number of collections of insects. The largest and most important of these forms part of the collective exhibit of the Agricultural Colleges and Experiment Stations. I regret very much that few good words can be said for this collection. It is made up of contributions from the entomologists of quite a number of the Stations, and it is to be noted that some of them have entirely failed to comprehend the scope of the exhibit, while others have prepared boxes which would be considered very inferior, even in an amateur collection. There are some good cases, of course; but as the writer is also one of the contributors to this alcove, it would be better to allow some one else to point out the poor boxes. Besides the character of the collection, the installation leaves much to be desired, and the location is such that the boxes are subject at times to very considerable jars. The result is seen by the broken specimens piled up in the bottom of the boxes. A great many of these will have little or no value when they are returned to their owners. Yet, it will pay to examine the collection carefully, since it illustrates the methods of a number of entomologists from all parts of our country, and there is an abundance of opportunity to compare the difference between good and bad work.

Besides this entomological alcove, there is in connection with the same exhibit, an entomological laboratory, in which it was intended to show the complete working outfit of a well-equipped Station. It was originally intended that in this laboratory certain experiments should be carried on and a considerable number of insects bred during the season, illustrating practically, some of the work of the entomologists. Lack of funds, among other things, has prevented the carrying out the original plan, and the exhibit is at present by no means what it was intended to be, when it was originally planned by the writer; yet there will be found in this exhibit a great deal that will interest entomologists, since it contains devices of all kinds contributed by a large number of work-

ing entomologists, and it is especially rich in apparatus for the study and preservation of insects, in lines which are not touched upon in the collection under Dr. Riley's charge.

In this building Canada has also an exhibit of insects in connection with her Agricultural display, which I overlooked; but which has been described to me as a very good one, representing a general collection than special economic features.

Minnesota has, in connection with her agricultural exhibit, quite a number of boxes in very good condition. This is, in large part, composed of Coleoptera and Lepidoptera arranged without economic purpose, and in part a collection illustrating oak insects and injurious grasshoppers. Perhaps the most interesting box in the entire series is one illustrating the bee moth and its work; the samples of injury being in some respects the best that I have ever seen.

In the Austrian section there are a number of bottles illustrating the transformation of insects, and other small animals. These bottles are extremely well prepared, and are educational in character. So far as I know, these are all the entomological exhibits in the agricultural building which have any claim to attention. There are, in some of the South and Central American exhibits, a few specimens of insects, without name and without purpose, except to show that such things do occur.

An excellent entomological exhibit is to be found in the Illinois State building in connection with the show made by the State University, and this is under the direction of Prof. Forbes. It contains a very well-equipped laboratory, illustrating the methods of work in use at Champaign, and also a number of insect collections. One of the interesting features is a series illustrating the food of one robin for one entire year, and this illustrates in a very graphic manner the difficulty in determining whether a bird is to be classed as beneficial or injurious. There is also a very good collection of insects injurious to corn, and a very large collection of forms that injure the apple. Of less economic interest is a collection of the common insects of the State with an attempt to illustrate forms occurring in all parts of it and others that occur in limited localities only.

In the Kansas State building there is a collection, mostly Lepidoptera, systematically arranged, illustrating no economic problems and apparently a sample of the State College collection. I am

informed that in some other of the State buildings there are attempts at entomological collections; but they escaped me and are not of any extent.

In the Forestry building there are a number of collections illustrating insects injurious to trees. Of those seen by me, that in the West Virginia section was by all odds the best, and Mr. Hopkins has made a very creditable showing indeed.

Michigan has a few boxes of insects, but these are very far inferior to the others. I am informed that one other of the States has an exhibit in this building; but I did not see it.

In the German section there are four boxes illustrating rather a method of preparing insects of this description than any considerable portion of the insects themselves.

Russia, on the contrary, shows a very full series of Forestry insects, very respectfully prepared; but affording nothing new or suggestive as to methods of arrangement or of preservation.

In the "Liberal Arts" building, Japan has a very large lot of boxes containg insects from central Japan, very well mounted as a whole, and systematically arranged, but without names, and with no economic interest. In the educational exhibit in this same building, Japan shows other specimens of insects illustrating the work done in some of her schools. Germany has in this same department a series of boxes with very well prepared and very well mounted specimens, remarkable for the number of blown larvæ.

Oregon has, as part of its educational exhibit, a battered *Cecropia* moth, which very well illustrates the character of the specimens preserved by the ordinary school-boy.

Michigan shows a series of very well-prepared boxes in her educational exhibit, and if these boxes could be taken as showing the average work of the students in the Agricultural College, it would deserve nothing but the highest possible praise. Unfortunately, however, the collection is obviously in its greater portion the work of special students, the larger part prepared by Mr. Davis, who is a professional. The exhibit therefore fails entirely in what should be its purpose; that is, to show the work actually done by the students in the ordinary course of their studies. If it had shown the insects as prepared by the students, in the boxes in which they are prepared, it would have had a distinct educational value; as it is, it simply illustrates how well

the insects collected can be arranged in boxes especially prepared for exhibition.

In the building devoted to Ethnology and Anthropology there are two collections of insects, neither of them of economic interest. One of them illustrates the insects of Colorado, and is prepared by Prof. Gillette. The other, consisting of Lepidoptera, belongs to a Chicago lady, and contains specimens from all parts of the world, most of them very well named.

As a whole, the collections of insects at Chicago are rather disappointing, and it is perhaps to be regretted that the opportunities offered during the present year have not been of more advantage to entomology and entomologists.—J. B. S.

Mr. W. E. Longley has kindly favored the NEWS with some notes on the same subject. As they traverse much of the same ground which Prof. Smith has just gone over, we here print those referring only to such entomological exhibits as he has not mentioned.

The U. S. of Columbia makes a very showy exhibit in their own building. In an ordinary mercantile show-case, about ten feet long, are pinned some two hundred butterflies and one hundred beetles. There is no attempt at a scientific arrangement, but the specimens are pinned in alternate rows of blue, yellow, brown, etc., making a picture that catches the popular eye.

Costa Rica, Java, Brazil, Mexico, and British Guiana have each a few specimens.

Ecuador brought quite a number of her Lepidoptera to the Exposition in papers, but has not set and displayed them for exhibition.

Finally, in the gallery of the Mining building, Friedrick Ehrensberger, of Eichstadt, Bavaria, exhibits a series of fossil insects from the lithographic stones and of those enclosed in amber.—P. P. C.

LOCAL LIST OF CATOCALA.

By O. D. FOULKS, Millbrook, Duchess Co., N. Y.

Being much interested in several articles in the NEWS where collectors have given the result of their catch, the manner of proceeding, and the fruitfulness of localities, I thought some others would be interested in work in this neighborhood. During

the past Summer I have taken over fifteen hundred *Catocala* from one fourteen-acre piece of mixed timber,—oak, chestnut, ash, etc. This does not include imperfect ones, or those slightly damaged, that were allowed to escape, or were discarded on careful examination. I cut a path completely around the inside of woods, about fifty feet from edge, then selected trees thirty or forty yards apart, and used the commonest molasses and vinegar. I had in all about one hundred trees thus marked. In the three months I have taken out of the woods thirty-five species, with four more yet to determine. The following is my list:

CATOCALA.

nubilis,	*marmorata*,	*habilis*,
elonympha,	*parta*,	*paleogama*,
amica,	*unijuga*,	var. *phalanga*,
gracilis,	*briseis*,	*neogama*,
grynea,	*concumbens*,	*subnata*,
similis,	*cara*,	*piatrix*,
formula,	*amatrix*,	*judith*,
polygama,	*relicta*,	*robinsoni*,
cerogama,	*tristis*,	*retecta*,
ultronia,	*epione*,	*flebilis*,
coccinata,	*antinympha*,	*desperata*,
ilia,	*serena*,	*obscura*.

On the Differences Between the Larvæ of Cecrita bilineata and Heterocampa manteo.

By HARRISON G. DYAR.

The larvæ of the two species named above resemble each other so closely as to be almost indistinguishable. They do not differ in structure and the pattern of markings, though variable in both is identical. The larvæ are green, a reddish or a black band on the side of the head bordered with white. On the body are dorsal, subdorsal and stigmatal lines, the first two white and rather broad, the latter yellow and narrow. From this simple coloration the following variations occur: Patches of mottled, purplish brown appear in the dorsal space on joints 5, 7, 10 and 12, spreading to the adjoining segments in more heavily marked examples and finally filling in the whole space between the subdorsal lines, and in addition forming a lateral projection on joints 7 and 10 below the normal course of the subdorsal line. This curious variation occurs in both species.

The most salient points of difference consist first in the food-plant. *C. bilineata* feeding on the elm, always solitary, and *H. manteo* on the oak, gregarious when young. Second in the width of head; the full grown larva of *C. bilineata* having a head of from 2.9 to 3.3 mm. in width, while that of *H. manteo* varies from 4 to 4.3 mm. Besides these differences certain others are to be observed in the markings. The dorsal line in the green forms is narrower and more concrete in *manteo*, remaining clear and distinct in the brown form, while in *bilineata* it is entirely lost in this form. The dorsal space in the green form of *bilineata* is usually shaded with white, contrasting with the green lateral area; while in *manteo* it is green, concolorous with the sides, or the sides are shaded with white, producing the reverse condition to that seen in *bilineata*.

I am unable to detect any other differences. Larvæ collected in Plattsburgh, N. Y.

GRASSHOPPERS AT DULUTH, MINN.

By Frank S. Daggett.

During the past Summer, Duluth and vicinity has been visited by a grasshopper scourge, which remained with us until September, and as a result lawns are ruined, and flowers, except where protected by a gauze, are a rarity. Aside from the fact the labor of cutting lawns with a mower has been dispensed with all Summer, perhaps the most interesting thing in connection with this visitation is its effect upon butterfly life. Usually, we have a number of the most common varieties in profusion. *Colias* and *Pieris* came out as usual in the Spring, but upon the advent of the grasshoppers, which promptly devoured the red and white clovers, they soon disappeared, except in places where the destruction was slow. Later in the season the second brood made its appearance in very few numbers, and all through August, when they are generally plentiful, only an occasionally fresh one was to be seen, and one was as apt to meet it among dense brush seeking for some hidden flower as the open clover fields had been stripped of bloom by the grasshoppers. I do not remember having seen a ragged or faded specimen during the season, which would indicate, in the absence of flowers, death by starvation before sufficient time had elapsed to make them weather worn.

V. antiopa were very plentiful in 1887, following a Winter of heavy snow, clusters of their larvæ being found everywhere on the willows; again this Spring the larvæ were still more plentiful for the first time since 1887, last Winter bringing an unusual heavy fall of snow. This year the larvæ all fed upon poplar, willow being entirely neglected. Their abundance may be appreciated when I state that in order to interest my two children in the study of insect life I prepared a number of breeding-boxes and they collected enough larvæ to raise over 900 perfect adults, and I noticed them about the country everywhere while driving. In spite of this abundance of larvæ very few adults were seen later at any one time. They seemed to come out, live a few days, and then disappear. It was the same with all, except *Chrysophanus americana*, which was exceedingly plentiful about the Golden Rod, whose late blooming habit saved it from the grasshoppers.

It would seem that the heavy fall of snow last Winter, which, in this section, has usually been followed by a very successful Summer for the collector of Lepidoptera also proved very favorable for the preservation of eggs deposited by the grasshoppers. At this writing I am taking some satisfaction, after a season of disappointment from a collecting standpoint, in watching the rapid destruction of the pest by a great quantity of small hawks tarrying in this vicinity on their way South, who spend the entire day in swooping from some stump or stub, returning each time with a full fledged specimen. What persistent *collectors* they are!

MOVEMENTS OF PUPÆ AND ACTIVITY OF IMAGOS,

By R. R. Rowley, Louisianna, Mo.

Doubtless the same conditions of individual activity or sluggishness exist throughout the animal creation, less marked perhaps than in the human race, but the butterfly hunter, baffled in his attempts to outwit and capture some fairy-winged beauty, is hard to convince that one *cresphontes* is lazier than another, or that a wary *ursula* ever sleeps in the sunshine.

Perhaps there is no butterfly in Missouri more difficult to approach than *troglodita* unless it be *antiopa*, and yet both of these, several hours from the pupa, may be taken between the thumb and finger and placed flat on the hand, where they will remain motionless for some time. "Playing possum" one wants to call it.

Indeed, our experience with a great number of caterpillars of *antiopa* is, that the mature "worm" in the act of suspending, is rather awkward, more so than the larvæ of other native butterflies, many of them failing to fasten the cremaster in the button of silk and perishing in the fall.

Many butterflies will remain motionless for three or four hours after their wings have begun to expand, and we have kept some a whole day by darkening the cage or box. Others become active in a short time and cannot be persuaded to remain in a quiet condition, even in a darkened room.

Several butterflies in the same cage soon set up a fluttering, and, to secure an absolutely faultless specimen, individual pupæ must be isolated, unless your cage is very large.

Of all the patience-trying lepidopters with which we recollect having had dealings, *Grapta progne* is the most perverse. It is active as soon as its wings are expanded and such a flutterer as it is! It gives one no end of trouble before it is ready to set. Of eleven pupæ of this species but two unblemished specimens are to be seen on the setting-board. Indeed, one pupa never lost a whit of its activity from larvahood, but kept up a knocking against the side of the box that could be heard all over the room. One had to but touch the box to give this nervous little chrysalis an excuse for a fresh spell of drumming. It kept up this activity even after the colors of the imago were plainly visible through the pupal skin, to within less than an hour of its emergence as a butterfly.

Of the ten other pupæ no such behaviour was noticeable, and movement could be provoked only by handling.

I once reared fifty larvæ of the *luna* moth, and of that number of cocoons there were, perhaps, a dozen that kept up a rattling motion, all Winter. One pupa would begin to turn in his cocoon and the others, as if listening for the signal to join in the "racket," would follow, and, for several minutes, pandemonium would reign supreme in the box. Invariably a movement on the part of one would arouse the rest, governed, doubtless, by feeling, or a kindred sensation. We have known fresh pupæ of *Eacles imperialis* and *Anisota stigma* to move pretty much all over a box by using the cremaster as a cane.

The pupæ of *polyphemus* are not so active as those of *luna*, but both are more nervous than chrysalids of *cecropia* and *promethea*. *Regalis* is less demonstrative than *imperialis*. The test of a live pupa is to pour a little cold water or blow the breath upon the object when even a slight movement will give the desired information.

ENTOMOLOGICAL NEWS.

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PHILADELPHIA, PA., OCTOBER, 1893.

IT has always been recognized that scientific research is greatly furthered by the exchange of the various objects with which that research is concerned. For the transmission of objects of natural history from one country to another the mails have offered a cheap and speedy means. Heretofore, through the laxity with which the regulations on the subject have been enforced, it has been possible to enter such objects in the mails of the Universal Postal Union as samples of merchandise and under the rates of postage therefor. From official information lately received from the United States Post-office Department, it appears that such a rating is entirely unauthorized by existing provisions, and that objects of natural history may only be mailed according to the rates required for letters. The United States Post-office Department also stated that it had recently submitted a proposition to the countries comprising the Postal Union to modify the regulations so that such specimens may be received into the mails as samples of merchandise, but that a sufficient number of countries had voted against the proposition to defeat it. Those countries voting negatively were Austria, Bolivia, British India, Canada, Germany, Great Britain, Guatemala, Hungary, Japan, Norway, Portugal, Russia, Spain, Sweden, Tunis, Uruguay and Venezuela. The Academy of Natural Sciences of Philadelphia has resolved to address the various scientific bodies with which it is in communication in these countries and to request them to memorialize their respective governments in favor of the proposed modification. The letter rate for postage (Universal Postal Union) is ten times that required for samples of merchandise, so that the former is virtually prohibitive.

While, therefore, the subject of the proposed modification of the postal regulation is one which concerns all zoologists and botanists, the NEWS would urge upon its readers to use such influence as they may be able to exert tending towards the change. It seems reasonable to hope that such foreign entomologists who read these words may do much in the way of valuable assistance.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

[The Conductors of ENTOMOLOGICAL NEWS solicit, and will thankfully receive items of news, likely to interest its readers, from any source. The author's name will be given in each case for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for certain issue. Owing to low subscription rate, "extras" will be charged for, and when they are wanted, it should be so stated on the MS. along with the number desired. The receipt of all papers will be acknowledged.—ED.

ON TICKS IN THE EARS OF MAMMALS.—In the June, 1893, number of the Journ. N. Y. Ent. Soc. there appeared an article by the writer on ticks in the ears of horses, in which it is stated that no mention could be found in literature of any species occuring in the ears of mammals. Since the paper was sent in, Part II of the report on the Death Valley Expedition conducted by Dr. C. Hart Merriam, has appeared in the North American Fauna No. 7, published by the U. S. Dept. of Agriculture. On page 252 of this work Dr. Riley mentions the following cases in point, the ticks having been determined by Dr. Marx:

Argas occidentalis Marx.—From dog's ear. Nevada.
Rhipistoma leporis Marx.—From rabbit's ear. Calif.
Dermacentor americanus L.—From child's ear. Calif.

Two other species are mentioned as taken, one from a jack rabbit and the other from a Thomomys, but apparently not from the ears. Since writing the paper above mentioned on ticks in horses' ears, I have been told that the same tick, which I there doubtfully referred to the genus *Argas*, also occurs plentifully in the ears of jack rabbits in Southern New Mexico. I have seen no specimens however. What is apparently the same species was also obtained from the ear of a coyote (see note on subject in ENT. NEWS).—C. H. TYLER TOWNSEND.

INSECTS REARED FROM BLACK KNOT, *Plowrightia morbosa*.—From a lot of knots collected in a single garden in Wayne County, Ohio, in April, I reared the following species, the knot being on both cherry and plum.

Hymenoptera: *Bracon fungicola* n. sp., Ashmead, M. S. *Phaenocarpa fungicola* n. sp., Ashmead, M. S. *Glypta vulgaris*, Cresson.

Diptera: *Cecidomyid* sp. ? *Muscid* sp. ?

Lepidoptera: *Sesia pictipes* G. & R. *Euzophera semifuneralis* Walk. *Tortrix* sp.?

Coleoptera: *Hydnocera verticalis* Say.

MR. H. M. BERNARD, in a recent communication in the Journal of the Linnean Society of London (xxiv, pp. 279—291) tries to show that the Mites are not *degenerated* Arachnids, but Arachnids permanently *fixed* at a larval stage of development.

PAIRING of different species.—On Aug. 17th, 1893, near Little Crum Creek, Ridley Township, Delaware Co., Pa., I observed a *Libellula pulchella* Drury ♂ and a *L. basalis* Say ♀ in coitu, but was unable to capture them.—P. P. CALVERT.

Besides the foregoing, there were great numbers of Mites of a light color, but the species were not determined. It would be an exceedingly interesting matter to determine just to what extent these insects aided in the diffusion of the spores of the fungus, and how much we are indebted to them for its spread from one locality to another.—F. M. WEBSTER.

THE Henry Edwards Entomological Corresponding Chapter of the Agassiz Association invites entomological students who read this notice to join its ranks. Members are expected to keep each other informed of the progress of their work in special lines of study, and to contribute to the published reports. During the Winter one or more courses in Elementary Entomology will be conducted. The initiation fee is 50 cents. For further particulars, address the Secretary, WILLIAM L. W. FIELD, Milton, Mass.

TWO UNCOMMON INSECTS.—Early in August, at Sea Cliff, L. I., I found on the bark of a chestnut tree a specimen of *Amphientomum hageni* Pack.; a little *Psocid* with hairs and scales on its wings. Later I found several darker specimens on a species of maple. It runs very rapidly over the bark, but does not attempt to fly. It was previously known from Maine, Massachusetts and Pennsylvania. On August 25th, I found on a fallen white birch a rare Capsid, *Cyclaphus tenuicornis* Say. The insect had not been seen since Say described it, until two years ago, when Messrs. Heidemann and Schwarz discovered it at Washington, D. C.—NATHAN BANKS.

SINCE Prof. J. B. Smith is unaware of the origin of the name "Ghost Moth" for the Hepialidæ, many of your readers are probably so also, and it may interest them to know that *the* "Ghost Moth" is the male of *Hepialus humuli*, and the name has been extended to the rest of the family. This moth is pure silvery-white and flies for just twenty minutes at dusk, swaying to and fro at the tops of the grass and facing the breeze, exactly as if attached to the extremity of a 30-inch pendulum, often, probably, doing so in churchyards and over graves. I was fortunate enough some years ago to discover that this conspicuous performance is done in order to attract the ♀ by sight. It has since been noted that in other species of the genus, also, the usual process is reversed, and that the female is attracted by the male, and that the scent tufts assist in the attraction, instead of probably merely "charming" the ♀ after she has attracted the male, as is no doubt their ordinary use.—I. A. CHAPMAN, Hereford.

Pimpla conquisitor Say, was seen in great numbers (July 17th) flying up and down the bark of trees in Logan Square, Philadelphia. The interstices of the bark were full of the larvæ and cocoons of *Orgyia leucostigma*, which had been coraled by a ring of tar about four feet from the ground. It was inferred that the *Pimpla* is parasitic upon the above-mentioned moth larvæ.

ACUTE LARVAL FORESIGHT OF *Thyreus abbotii*.—The daughter of a Westchester County friend, beyond Mount Vernon, N. Y., for several years tried to raise a few pupæ for me of such larvæ, which infected their grape arbor. Generally she failed. As usual, when I visited this locality this July for *A. idalia*, *Sat. alope*, and *Neon. canthus*, she handed me two segar-boxes for inspection. One contained five *Dæapsa myron* larvæ, dried up leaves and not enough of hard garden loam in lumps, to half cover bottom of box. The other disclosed four *abbotii* larvæ half-grown, but turning dark as if to pupate, more dried-up leaves, and no earth whatsoever. A few larvæ were dead in both boxes. Under the leaves I found a cocoon-like object, which, when examined, proved to be a full-grown *abbotii* larvæ "spun up" in a grape vine leaf, perfectly cylindrical in outline and closely encasing the contracted larva. It was in fine condition.

For years I instructed this young lady and family how to raise larvæ of desirable species, and not to be afraid of handling such. This year many of these larvæ were thrown in the fire, so that they could not "sting or bite" the little children! I made another search for larvæ with the aid of the children, and in an hour had found fifteen others of half-grown and larger *myron* and *abbotii* larvæ on that arbor. They were put in a barrel half filled with moist loam, in the centre of which I placed a tomato-can filled with water, containing food-plant and loose grass to prevent larvæ falling into it. Top was covered with heavy manilla paper and cheese-cloth to prevent cats and other curios from lodging therein. It is the object lesson which best convinces and teaches the most indifferent of all mankind. —RICHARD E. KUNZE, M. D., New York.

RAVAGES OF THE WHITE ANT.—The rapid increase within a few years of the white ants (*Termes flavipes*) in the city of New York, and especially Harlem, which is now overrun with them, makes the fact of their present and future injury a very serious one, especially as their habits and lives while underground are so very little known, it having always been supposed that there was but one queen in each colony, while the fact is that their number varies in different colonies, having found as many as nine and at another time fourteen laying and fertile queens living together in the same cell or gallery, this being I believe the first record of queens being found . . . . . It is not alone to dead wood, whether sound or decaying, that they confine their operations; living plants and shrubs are just as liable to their attacks, and some kinds seem to be preferred to the decaying wood, which is their natural food. Such are geraniums, of which they are very fond, eating everything but the outer skin and leaves, which they leave intact. I had over twenty standard geraniums, from two to

three feet high, destroyed by them in one Summer, as well as the stakes which supported them. Red currants are also liable to their attacks, besides various other shrubs and plants, while the root of grasses also serve them as food.—L. H. JOUTEL in Jour. of the N. Y. Ent. Soc., June, 1893.

CLASSIFICATION OF THE TRACHEATE ARTHROPODS.—Pocock proposes the following classification of this group (Zool. Anz., July 3, 1893):

A. Generative organs open in the anterior part of the body, apparently on the third metacephalic somite . . . . . **Progoneata.**
  a. Antennæ branched; segments of body of adult not formed by fusion of two embryonic somites . . . . Class **Pauropod** Lubbock.
  b. Antennæ aimple; some segments of body of adult formed by fusion of two embyonic somites . . . . Class **Diplopoda** Blainville.

B. Generative organs open at the posterior end of the body close to the anus . . . . . **Opisthogoneata.**
  a. Metacephalic region of the body not divisible into distinct regions, but composed of a series of similar or approximately similar somites, each of which bears a pair of ambulatory appendages **Homopoda.**
    a. Two (perhaps three) pairs of gnathites, feet biunguiculate Class **Symphyla** Ryder.
    B. Four pairs of gnathites; feet tipped with one claw Class **Chilopoda.**
  b. Metacephalic region of body divisible into two distinct regions, the anterior of which, composed of three somites, bears three pairs of legs, while the posterior is never in the adult furnished with ambulatory appendages . . . . . Class **Hexopoda.**

Identification of Insects (Imagos) for Subscribers.

Specimens will be named under the following conditions: 1st, The number of species to be **limited to twenty-five** for each sending; 2d, The sender to pay all expenses of transportation and the insects to become the property of the American Entomological Society; 3d, Each specimen must have a number attached so that the identification may be announced accordingly. Exotic species named only by special arrangement with the Editor, who should be consulted before specimens are sent. Send a 2 cent stamp with all insects for return of names. Before sending insects for identification, read page 41, Vol. III. Address all packages to ENTOMOLOGICAL NEWS, Academy Natural Sciences, Logan Square, Philadelphia, Pa.

Entomological Literature.

TRANSACTIONS OF THE AMERICAN ENTOMOLOGICAL SOCIETY, XX, 2, July 1, 1893.—The Galerucini of Boreal America, G. H. Horn, 1 pl. Miscellaneous Coleopterous Studies, id. Notes on Bees, with descriptions of new species, C. Robertson. The Phalangida Mecostethi, N. Banks.

BULLETIN OF THE AMERICAN MUSEUM OF NATURAL HISTORY, V, pp. 87–94. New York, June, 1893.—Notes on transformations of some North American moths, W. Beutenmüller.

ARCHIVES ITALIENNES DE BIOLOGIE xix, fasc II. Turin, 1893.—Observations on the respiratory movements and muscles of the thorax of Coleoptera, L. Camerano (original in the Atti R. Accad. Sci. Torino xxviii). On the respiratory phenomena of the chrysalis of *Bombyx mori*, L. Luciani and Dr. D. Lo Monaco (original in Atti R. Accad. Georgofili xvi, 1), On the contraction of the striated muscles and on the movements of *Bombyx mori*, Dr. M. L. Patrizi (original Atti R. Accad. Sci. Torino xxviii, 9).

COMPTE RENDU. L'ACADEMIE DES SCIENCES. Paris, June 12, 1893.—On the oil of eggs of the grasshopper or wandering locust (*Acridium peregrinum*) of Algeria, R. Dubois.—July 31, 1893. On the cerebral nuclei of myriapods, J. Chatin. Researches on the anatomy and the development of the male genital armature of Orthopterous insects, A. Peytoureau.

PROCEEDINGS OF THE ENTOMOLOGICAL SOCIETY OF WASHINGTON, ii, 4, June 30, 1893.—Is *Megastigmus* phytophagic?, C. V. Riley. Annual address of the President—Parasitism in insects, id. Note on *Galeruca xanthomelæna*, id. Summary of a collection of Hemiptera, secured by Mr. E. A. Schwarz in Utah, P. R. Uhler. On spiders' web, Dr. G. Marx. Notes on some Cecidomyidæ of the vicinity of Washington, D. C., C. H. T. Townsend. Notes on certain Cecidomyiidous galls on *Cornus*, id. Biologic notes on some species of Scolytidæ, F. H. Chittenden.

PSYCHE. Cambridge, Mass., July, 1893.—The primitive number of Malpighian vessels in insects II, W. M. Wheeler. Descriptions of new species and genera of West African Lepidoptera—VII, W. J. Holland, 2 pls. A cabbage-like Cecidomyiidous gall on *Bigelovia*, C. H. Tyler Townsend.—August, 1893. The primitive number of Malpighian vessels in insects, iii, W. M. Wheeler. Notes on *Gluphisia* and other Notodontidæ, A. S. Packard. A description of the larva of a species of the *Lintneri* group of *Gluphisia*, H. G. Dyar. A cocks-comb gall on *Rhus microphylla*, C. H. T. Townsend. Tardy wing expansion in *Callosamia*, C. G. Soule.

BIOLOGIA CENTRALI-AMERICANA. Pt. cix. London, May, 1893.—Lepidoptera-Rhopalocera, vol. ii, pp. 265–288, F. D. Godman and O. Salvin. Lepidoptera-Heterocera, pp. 145–160, H. Druce. Rhynchota-Heteroptera, pp. 441–462, i–xx, title page, W. L. Distant. Pls. xxxvi–xxxviii.

THE ANNALS AND MAGAZINE OF NATURAL HISTORY. London, July, 1893.—List of insects collected by Miss Elizabeth Taylor in Western North America [Slave River] in the Summer of 1892, A. G. Butler and W. F. Kirby. Notes on some Mexican Coccidæ, T. D. A. Cockerell. The coxal glands of *Scorpio*, H. M. Bernard, 1 pl.

REVUE DES SCIENCES NATURELLES DE L'OUEST, III, 1. Paris, Jan.–March, 1893.—Exposition of opinions expressed on the morphological value of the solid pieces of the genital armor of insects, Dr. A. Peytoureau.

ZOOLOGISCHER ANZEIGER. Leipsic, June 26, 1893.—Supplementary note on the egg of the apterous agamic *Phylloxera*, V. Lemoine. On the development and life-history of *Pogonius bifasciatus* F. (Hymenoptera), C. Verhoeff.—July 3. On the classification of the Tracheate Arthropoda, R. I. Pocock.—July 31. On the structure and the signification of the endosternite of Arachnids, W. Schimkewitsch, figs.—August 14. News of water mites [*Axona*], R. Piersig, figs. The "head" of *Galeodes* and the procephalic lobes of Arachnidan embryos, H. M. Bernard, figs.

THE CANADIAN ENTOMOLOGIST. London, Ont., July, 1893.—Comments on Mr. Van der Wulp's recent diagnoses of new species of Mexican Phasiidæ, Gymnosomatidæ, Ocypteridæ and Phaniidæ, C. H. Tyler Townsend. Description of the grubs of *Chrysomela exclamationis*, id. A list of species of Diptera from San Domingo, S. W. Williston. Fitch's types of N. A. Membracidæ, F. W. Goding. North American Thysanura II, A. D. Macgillivray. A new Asilid genus related to *Erax*, D. W. Coquillett. Notes on collecting some of the smaller Sesiidæ in the London (England) district, L. Gibb. A suggestion as to the identity of *Cycnia dubia* Walk., H. G. Dyar. A new lac-insect from Jamaica, T. D. A. Cockerell. Notes on *Taxonus nigrisoma* and *T. dubitatus*, J. G. Jack. Note on *Copimamestra* and *Eulepidotus*, A. R. Grote. Descriptions of certain Lepidopterous larvæ (cont.), H. G. Dyar. *Lithophane oriunda*, J. A. Moffat.—August, 1893. Some interesting color varieties in the genus *Crossidius*, H. F. Wickham, 1 pl. Notes on two species of Tenthredinidæ, from Yosemite, Cal., H. G. Dyar. Fitch's types of N. A. Membracidæ, F. W. Goding. Synopsis of the Dipterous genus *Thereva*, D. W. Coquillett. Some notes on Michigan insects, principally Coleoptera, affecting forest trees, C. H. T. Townsend. The Phalanginæ of the U. S., N. Banks. A black male of *Papilio turnus*, A. S. Van Winkle.

THE ENTOMOLOGIST. London, July, 1893.—Sex ratios in butterflies and an inference, T. E. Bean.

THE Insect Enemies of Small Grains by Lawrence Bruner. Extr. Ann. Rep. Nebraska State Board Agric. 1893, pp. 360–468, 111 figs. Lincoln, Neb., 1893.

PROCEEDINGS OF THE ZOOLOGICAL SOCIETY OF LONDON, 1893. Pt. 1. London, June 1, 1893.—A proposed classification of the Hesperiidæ, with a revision of the genera, E. T. Watson, 3 pls. Descriptions of new species of Dipterous insects of the family Syrphidæ in the collection of the British Museum, with notes on species described by the late Francis Walker.—Part I. Bacchini and Brachyopini, E. E. Austen, 2 pls.

SCIENCE. New York, July 21, 1893.—A silk-spinning cave larva, H. Garman.—August 11. Preliminary note on the cottony scale of the osage orange, T. D. A. Cockerell.—August 25. The Cornell mixture [Insecticide and Fungicide], M. V. Slingerland. Notes on marine and fresh-water larvæ of midges, G. Swainson.

JOURNAL OF THE NEW YORK ENTOMOLOGICAL SOCIETY, I, 2, June, 1893.—Ticks in the ears of horses, C. H. T. Townsend. New North American Aculeate Hymenoptera, W. J. Fox. Notes on the life-histories of some Notodontidæ, ii, A. S. Packard. Another leaf-miner of *Populus*, C. H. T. Townsend. Note on a new Antlion allied to *Myrmeleon blandus* Hagen, id. A Nycteribid from a New Mexico bat, id. On the food habits of North American Rhynchophora, W. Beutenmüller. Some notes on the ravages of the white ant (*Termes flavipes* L.) A. Joutel. Capture of *Brotis vulneraria* R. Ottolengui. List of the Coleoptera of Eastern North America, C. W. Leng and W. Beutenmüller.

THE WEST AMERICAN SCIENTIST, San Diego, Calif., July, 1893.—On an apparently Microlepidopterous leaf-miner of the vine, C. H. Tyler Townsend.—August, 1893. Some larvæ on scrub oak, C. H. Tyler Townsend. Notes on *Hemileuca*, id. The peach and apricot borer of southern New Mexico, id.

BULLETIN OF THE OHIO AGRICULTURAL EXPERIMENT STATION. Technical series, I, 3. Norwalk, Ohio, April, 1893.—Methods of oviposition in the Tipulidæ, F. M. Webster, figs. A Dipterous gall maker and its associates, id., figs. Notes of some species of Ohio Hymenoptera and Diptera heretofore undescribed, id., figs. Description of a new species of gall-making Diptera, J. Marten, figs. Description of a species of *Chlorops* reared from galls on *Muhlenbergia mexicana*, S. W. Williston. Descriptions of new parasitic Hymenoptera bred by F. M. Webster, W. H. Ashmead, A. Tachinid reared from cells of a mud-dauber wasp, C. H. T. Townsend.

THE ENTOMOLOGIST'S MONTHLY MAGAZINE. London, July, 1893.—Explanatory notice of my views on the sub-orders of Diptera, C. R. Osten Sacken. Notes on new or little-known Coccidæ, 4, R. Newstead. The West Indian species of *Mytilaspis* and *Pinnaspis*, T. D. A. Cockerell, figs. Courtice's breeding-cage, with variations, H. G. Knaggs, M.D.

III JAHRESBERICHT DES WIENER ENTOMOLOGISCHEN VEREINES 1892. Vienna, 1893.—The genus *Parnassius* Latr. in Austria-Hungary, Dr. H. Rebel and A. Rogenhofer, 1 col. plate.

COMPTE RENDU. SOCIETE DE BIOLOGIE. Paris, July 1, 1893.—Note on the pilicolous Sarcoptids (Listrophorinæ), Dr. E. Trouessart.

TRANSACTIONS OF THE ALBANY INSTITUTE xii.—Insects of the past year and progress in insect studies, J. A. Lintner.

ACTA SOCIETATIS PRO FAUNA ET FLORA FENNICA, viii.—Helsingfors. Phytometridæ of Finland, A. Poppius, 2 pls.

THE ENTOMOLOGIST'S RECORD. London, July 15, 1893.—The pupal and imaginal wings of Lepidoptera, Dr. T. A. Chapman. On the pupal wing in butterflies, J. W. Tutt. Melanochroism in British Lepidoptera, A. R. Grote, J. W. Tutt, continued in the number for August 15th.

BERLINER ENTOMOLOGISCHE ZEITSCHRIFT xxxvii, 3. Berlin, October, '92.—List of the Glaphyridæ, Melolonthidæ and Euchiridæ described since 1871, A. F. Nonfried. The gall-flies [Cecidomyidæ] of the Konigliche Museums fur Naturkunde at Berlin, E. H. Ruebsaamen, 12 pls.—4. May, 1893. On the characters of the three divisions of Diptera: Nemocera vera, Nemocera anomala and Eremochæta, C. R. Osten Sacken. Corrections as to matters of fact in Baron Osten Sacken's article, F. Brauer. On some nymphs of Aculeata, C. Verhoeff. Biological observations, especially on *Odynerus parietum*, id. On Proterandry of the Diplopoda, id.—xxxviii, 1 and 2, July, 1893. The insects of the district of Adeli back of Togo, West Africa, from the materials collected by Capt. Eugen Kling (1888–89) and Dr. Richard Büttner (1890–91), Dr. F. Karsch, with an introduction by Dr. R. Büttner. Part 1: Apterygota, Odonata, Orthoptera Saltatoria, Lepidoptera Rhopalocera, 35 figs., 6 pls.

DEUTSCHE ENTOMOLOGISCHE ZEITSCHRIFT, 1893, Erstes Lepidopterologisches Heft. Berlin, July, 1893.—Biography of Adolf Speyer, Otto Speyer. Revision of the Pierid genus *Delias*, H. Ritter von Mitis, 2 pls. —Zweites heft, July, 1893. Comparative researches on the abdominal segments, especially the ovipositing apparatus of female Coleoptera, a contribution to the phylogeny of the same, C. Verhoeff, 2 pls. Revision of the species of the Coleopterous genus *Prosodes* Eschr., E. Reitter. Remarks on and additions to the "Catalogue systématique des Cicindelidæ" par Fletiaux (1893), W. Horn.

THE KANSAS UNIVERSITY QUARTERLY, II, 1. Lawrence, Kans., July, 1893.—Revision of the genera *Dolichopus* and *Hygroceleuthus*, J. M. Aldrich, 1 pl. New genera and species of Psilopinæ, id.

THE LARVÆ OF THE BRITISH BUTTERFLIES AND MOTHS by (the late) William Buckler, edited (in part) by (the late) H. T. Stainton, vol. v. The second portion of the Noctuæ. London, the Ray Society, 1893. Pp. xi, 90, pls. (colored) lxx–lxxxvi.

A Monograph of the British Phytophagous Hymenoptera (Cynipidæ and Appendix). Vol. iv. By Peter Cameron. London, the Ray Society, 1893; 248 pp., 19 colored plates.

ICONES ORNITHOPTERORUM: A monograph of the Rhopalocerous genus *Ornithoptera*, or bird-wing butterflies. By Robert H. F. Rippon. Pt. 5, containing four plates and text. Published by the author, London, November, 1892.

MICHIGAN AGRICULTURAL EXPERIMENT STATION, Bull. No. 98. Agr. College, Michigan, July, 1893. Locusts—The horn-fly, G. C. Davis, figs.

BULLETINO DELLA SOCIETA ENTOMOLOGICA ITALIANA, xxv, 2. Florence, Aug. 5, 1893.—Revision of the European species of the family Culicidæ—mosquitoes, E. Ficalbi. On the so-called *Bugonia* of the ancients, and its relation to *Eristalis tenax*, a two-winged insect, C. R. Osten Sacken.

THE TRANSACTIONS OF THE LINNEAN SOCIETY OF LONDON. Zoology, v, pt. 8., September, 1892.—The development of the head of the imago of *Chironomus*, L. C. Miall and A. R. Hammond, 4 pls.—Pt. 9, November, 1892. On the variations in the internal anatomy of the Gamasinæ, especially in that of the genital organs, and on their mode of coition, A. D. Michael, 4 pls. Journal of the same. Zoology, xxiv, 154, May 5, 1893. On the Buprestidæ of Japan, G. Lewis. No. 152, July 20. Some observations on the relation of the Acaridæ to the Arachnida, H. M. Bernard, 1 pl.

JAHRES-BERICHT DER NATURFORSCHENDEN GESELLSCHAFT GRAUBUNDENS. N. f. xxvi. Chur, 1893. On formic acid in honey, Dr. A. v. Planta.

ARCHIV FUR NATURGESCHICHTE, lix, I, 3. Berlin, July, 1893.—Contributions to the knowledge of the mouth parts of the Trichoptera, R. Lucas, 3 pls.

LE NATURALISTE. Paris, Aug. 1, 1893.—A Dipter [*Thryptocera Lithobii*] parasitic on myriapods of the genus *Lithobius*, A. Giard.—August 15. Observations on the phases of the coloration of a nymph of *Ichneumon ruficaudus* Wesm., L. Planet, figs.

JAHRESHEFTE DES VEREINS FUR VATERLANDISCHE NATURKUNDE IN WURTTEMBERG, xlix. Stuttgart, 1893.—On the formation of hermaphroditic insects, Dr. J. Vosseler. Biological communications on some Orthoptera from Oran, id.

TRANSACTIONS AND PROCEEDINGS OF THE NEW ZEALAND INSTITUTE, xxv, Wellington, May, 1893.—Further Coccid notes, etc., W. M. Maskell.

SITZUNGSBERICHTE DER KONIGLICH PREUSSISCHEN AKADEMIE DER WISSENSCHAFTEN ZU BERLIN, 1893, xiv-xvi.—On noteworthy occurrences in the sperm of *Dytiscus marginalis*, Dr. L. Auerbach.

THE BRITISH NATURALIST. London, August, 1893.—The "Melanism" controversy, W. E. Sharp.

OVERSIGT OVER DET KONGELIGE DANSKE VIDENSKABERNES SELSKABS FORDHANDLINGER, 1892, No. 3. Copenhagen,—Copulatory organ and copulation of *Melolontha*, J. E. V. Boas, 1 pl.

ZOE. San Francisco, July, 1893.—Description of a luminous [Coleopterous] larva found near Holbrook, Ariz., C. H. T. Townsend. Note on *Termopsis angusticollis*, id.

THE PROCEEDINGS OF THE LINNEAN SOCIETY OF NEW SOUTH WALES (2) vii, 3.—Sydney, March, 1893.—Gall-making Buprestids, W. W. Froggatt.

COMPTE RENDU. SOCIETE PHILOMATHIQUE DE PARIS, July 22, 1893.—Note on an entomophagous insect, parasitic on European silk worms [*Doria meditabunda* Meig.], E. J. Bouvier and Delacroix.

ANATOMISCHER ANZEIGER. Jena, Aug. 5, 1893.—On the remarks of Dr. Ballowitz concerning the sperm of *Dytiscus marginalis*, L. Auerbach.

JOURNAL OF THE ROYAL MICROSCOPICAL SOCIETY. London, 1893, 1 pt. 4.—Notes on some of the digestive processes in Arachnids, H. M. Bernard, 1 pl.

INSECT LIFE, v, 5. Washington, July, 1893.—The present year's appearances of the periodical cicada, Eds. Further notes on Yucca insects and Yucca pollination, C. V. Riley, figs. On the pollination of *Yucca whipplei* in California, D. W. Coquillett. The cocoanut and guava mealy-wing (*Aleurodicus cocois* Curtis) Eds., figs. Further notes on the cotton-tail-bot with the breeding and identification of the fly, C. H. T. Townsend. The sugar-beet web-worm (*Loxostege sticticalis* L.), Eds., figs. Report on a trip to northwest Missouri to investigate locust injuries, H. Osborn. The angoumis grain moth or "fly weevil" (*Gelechia cerealella*), L. O. Howard. Descriptions of Noctuidæ from the Death Valley, J. B. Smith, figs. The red-legged flea beetle (*Crepidodera rufipes* L.), Eds. figs.

VERHANDLUNGEN DER K. K. ZOOLOGISCH-BOTANISCHEN GESELLSCHAFT IN WIEN, xliii, 1, March 1893.—On the eye of *Scutigera coleoptrata*, Dr. T. Adensamer.—2. July, 1893. On parthenogenesis among spiders, N. Damin. To the knowledge of the Coleopterous genus *Trichodes* Herst., a monographic study, K. Escherich, 2 pls.

NATURE. London, Aug. 24, 1893.—The fungus-gardens of certain South American ants, J. C. Willis [Abstract of Möller's paper, see ENT. NEWS, September, p. 239]. A few remarks on insect prevalence during the Summer of 1893, Miss E. A. Ormerod.

DENKSCHRIFTEN DER KAISERLICHEN AKADEMIE DER WISSENSCHAFTEN, lix, Vienna, 1892.—New species of the genera *Phytopsis* Duj. and *Cecidophyes* Nal., A. Nalepa, 4 pls.

Reports of the United States Commissioners, Universal Exposition. Paris, 1889; vol. v.—On the useful and injurious insects, C. L. Marlatt.

REVIEW.—PART III OF BRAUER AND BERGENSTAMM'S MONOGRAPH OF THE MUSCARIA SCHIZOMETOPA.—The third part of this work has recently appeared (Denkschr. d. Math.-Naturwiss. Cl. d. Kais. Akad. d. Wissenschaft., bd. lx, Wien, 1893). It contains 152 pages quarto, no plates, and comprises in the main an analytic table of sections, and another of genera. These tables cover 91 pages, and will be of great use in the determination of the genera erected by the authors. The value of the work is enhanced to American students by the fact that the authors have examined the large collection of Tachinidæ, etc., of the U. S. National Museum, sent them by Dr. Riley, the results being considered in this part. Following the tables there are 30 pages of notes and descriptions, which number 115 in all, of much use in defining the position of recently described and other genera in the Brauerian system. The numerous genera erected by the

writer are carefully considered, and their affinities pointed out so far as practicable from the descriptions. In these notes the authors describe and name a new genus *Rileya* (type *R. americana*), in honor of Dr. Riley. It is unfortunate that two Hymenopterous genera have already been named *Rileya*, one by Mr. Howard and one by Mr. Ashmead. The tachinid genus might, however, be known as *Rileymyia*. Further notes on the sections and the genera they embrace follow, together with a summary of the writer's groups and genera of North American Tachinidæ *s. str.* given in the Trans. Am. Ent. Soc. A supplement to the alphabetic list of species mentioned in the work comes next. The whole is concluded by a general index of all the genera mentioned in the three parts, which contains all the Calyptrate Muscid genera of the world erected up to the time of publication of this part.—C. H. TYLER TOWNSEND.

NEW SPECIES OF NORTH AMERICAN INSECTS DESCRIBED IN THE PRECEDING LITERATURE.

COLEOPTERA.

Galerucini: n. gen. et spp. Horn, Trans. Am. Ent. Soc. xx, pp. 57–136; and of other families, id., *l. c.* pp. 136–144.

Nematocephalus guatemalensis Senna, Bull. Soc. Ent. Ital. xxv, p. 128, tav. 1, f. 4, Guatemala.

DIPTERA.

Cecidomyia bigeloviæ-brassicoides Towns., Psyche vi, p. 491, N. Mex.

Efferia (near *Erax*) Coquillet, Can. Ent. xxv, p. 175, type *anomalis* Bell. *E. pernicis*, p. 175, *candida*, p. 176, Cal. *E. rara*, Texas, p. 176.

Ocyptamus iris Austen, Proc. Zool. Soc. Lond. 1893, p. 133, *Baccha sagittifera* p. 144, Jam., with synonymy for other species.

Nycteribia antrozoi Townsend, Journ. N. Y. Ent. Soc. I, p. 79.

Lasioptera muhlenbergiæ Marten, Bull. Ohio Agr. Experiment Station (Tech. ser.) I, p. 155, Illinois.

Chlorops ingrata Williston, *l. c.*, p. 156, Ohio.

N. sp. *Dolichopus*, *Hydroceleuthus*, Aldrich, Kans. Univ. Quart. II, pp. 1–26. N. gen. et spp. Psilopinæ, id., *l. c.*, pp. 47–50.

Thereva n. spp. Coquillett, Can. Ent. xxv, pp. 197–201.

HEMIPTERA.

New species from Utah, Uhler, Proc. Ent. Soc. Wash. II, pp. 366–385.

New Coccidæ from Mexico, Cockerell, Ann. Mag. N. H. (6) xii, pp. 48–53.

Tachardia gemmifera Cockerell, Can. Ent. xxv, p. 181, Jam.

N. gen. et spp. Mexico, Cent. Am., Distant, Biol. Cent.-Am. Rhynch.-Heterop. pp. 441–462.

New Coccidæ, W. Indies, Cockerell, Ent. Mo. Mag. (2) iv, pp. 155–158.

HYMENOPTERA.

Aculeata, n. sp., Fox, Journ. N. Y. Ent. Soc. i, pp. 53–56, U. S.

Parasitica, n. sp., Ashmead, Bull. Ohio Agr. Exper. Station (tech. ser.) i, p. 159–165, Ohio.

Apidæ: n. spp. Robertson, Trans. Am. Ent. Soc. xx, pp. 145–149.

LEPIDOPTERA.

Thamnonoma gracilior Butler, Ann. Mag. N. H. (6), xii, p. 16, Slave River, etc. *Pseudosiona* n. gen. Geometrarum, p. 18, *P. taylori*, p. 18, near Mackenzie River.

N. gen. et spp. Mexico, Cent. Am., Godman and Salvin, Biol. Cent.-Amer. Lep. Rhop. ii, pp. 265–288. Druce, *l. c.* Lep. Heter. pp. 145–160.

Prodoxus intricatus Riley, Ins. Life, v, p. 307, Mexico.

Noctuidæ: n. spp. Calif., Smith, Ins. Life v, pp. 328–334.

NEUROPTERA.

Myrmeleon n. sp. (unnamed), Townsend, Journ. N. Y. Soc. i, p. 78.

PHALANGIDA.

N. gen. et spp. Banks, Can. Ent. xxv, pp. 205–211; Trans. Am. Ent. Soc. xx, pp. 149–152.

THYSANURA.

Japyx americanus Macgillivray, Can. Ent. xxv, p. 174, Wash.

The Entomological Section

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

PROCEEDINGS OF MEETINGS.

The following papers were read and accepted by the Committee for publication in ENTOMOLOGICAL NEWS:

A NEW SPECIES OF TORYMUS.

By WILLIAM H. ASHMEAD.

Torymus hainesii sp. n. ♀.—Length 23 mm.; ovip. 2 mm. Robust; thorax above dull bronzed green, shagreened, covered with short sparse hairs; head, pleura, coxæ and femora, except hind pair, mostly blue or purplish; hind femora and abdomen metallic bluish green; scape, mandibles, tibia and tarsi, brownish yellow; flagellum dark brown, the joints, after the first, scarcely as long as wide. The head is transverse, antero-posteriorly thin, the face and cheeks flattened, nearly smooth, feebly, very sparsely punctate; facial furrow large, the vertex in consequence, rather sharp. Thorax short, subovoid; pronotum short, contracted anteriorly;

mesonotum scarcely as long as wide with the parapsidal furrows distinct only anteriorly; metanotum extremely short, declivous posteriorly. Wings hyaline, nearly bare of pubescence, the venation light brownish yellow, the marginal vein very long, almost the length of the submarginal, the stigmal very minute, scarcely developed, while the postmarginal is only twice the length of the short stigmal. The abdomen is subsessile, oval, shorter than the thorax, subconvex above, boat-shaped beneath, its surface delicately, microscopically sculptured with wavy lines, smoother on dorsum towards base; second segment the longest, with the flap medially emarginated.

Hab.—San Julia, Lower California. Types in coll. Ashmead and coll. California Academy.

Described from three ♀ specimens taken in April, 1889.

This species comes nearest to *Torymus anthomyiæ* Ashm., but, besides its much larger size, it differs decidedly in its mesonotal characteristics, *T. anthomyiæ* having entire parapsidal furrows.

These two species with two or three other undescribed species form quite a distinct group in the genus.

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ON THE FEMALE OF PAPILIO ELWESII (Leech).

By JOHN WATSON, Manchester, England.

P. elwesii. Leech, Trans. Ent. Soc. Lond., 1886. Part II.—"On a collection of Lepidoptera from Kiukiang."

The description of the female of Mr. Leech's *elwesii* given below is taken from the first and only female known to science of this extremely rare and handsome species. Mr. Leech's specimens of the male (only two of which were viewed) were taken by Mr. Pratt, in Kiukiang in 1887, on the Yangtse River, 500 miles from the coast. The unique female now described was brought from Central China by a captain of a steamboat, and its exact locality is unfortunately unknown.

P. elwesii ♀.—Primaries more rounded than male, outer margin wavy. Primaries and secondaries blackish brown with on either side of nervures of primaries and anterior portions of secondaries from base to below the discoidal cell a plentiful supply of gray scales enclosing a black-brown streak in the centre of each internervular space; a faint blue irroration on upper and under surface of secondaries in the internervular space between the first and second submedian nervules and just next the anal ocellus. The posterior portion of secondaries and "tail" faintly glossed with blue a little more pronounced on under surface. The five crescentic marks exclusive of the ocellus at anal angle not so heavy as the male, particularly

that next the ocellus. Ocellus larger than the male. The tail differing from male in being rounded and not obliquely cut off (see plate). The space between first and second submedian nervules greater than in the male, giving the female tail a heavier appearance. Exp. 154 mm.; 6¼ ins.

Hab.—Central China.

In the collection of J. C. Hudson, Esq.

Fig. I.—Female. Fig. II.—Contour of "tail" of male.

I place this grand species next *rhetenor*. Mr. Leech writes me "I place *elwesii* next *rhetenor* also."

After examining a large number of specimens of the allies of *elwesii*, I find that the faint blue scales forming the often incomplete row of crescentic or orbicular marks on the secondaries of *rhetenor*, *protenor* (in a less degree) and found in its greatest profusion on upper and under surface of *polymnestor* and its insular variety *parinda*.

Unlike nearly all other *Papilios*, the tail of *elwesii* is not formed of the prolongation of the third submedian nervule, but is formed by the shortening of the fourth and fifth thus causing a distinct dip in the contour. In this habit it is also accompanied by its ally, *P. icarius* of Westwood.

OBITUARY.

On April 14, 1893, J. F. M. BIGOT, the well-known Dipterist. He was born in 1818.

On May 6, 1893, JAMES WOOD-MASON, on the way from Calcutta to England. Born in Gloucestershire in 1846. He was Professor of Comparative Anatomy at the Medical College of Bengal, and established a reputation through his entomological and deep sea researches.

On June 30, 1893, at Zurich-Hottingen, Switzerland, FRITZ RUHL, President of the Societas Entomologica, and editor of the journal bearing that name, in the 57th year of his age.

EXCHANGES

Not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at end of the column, and only when necessary those at the top (being longest in) are discontinued.

Coleoptera.—Price-lists wanted.—J. H. Bomberger, Box 76, Columbiana, O.

Lepidoptera.—I am studying the Noctuid genera *Euclidia*, *Drasteria* and *Litosea*. Specimens bought, exchanged or determined.—M. V. Slingerland, Cornell Insectary, Ithaca, N. Y.

Lepidoptera.—Wanted to purchase cocoons and larvæ from different parts of U. S. State name and price.—E. J. Kruegeman, 54 May St., Lake View, Chicago, Ill.

Lepidoptera.—Wanted to exchange, papers on N. Am. Lepidoptera for Noctuidæ or Heterocera generally. Noctuidæ named for privilege of retaining desiderata.—John B. Smith, New Brunswick, N. J.

Coleoptera of N. Am. and Mexico wanted by purchase or exchange; large collection.—Fred. C. Bowditch, Tappan St., Brookline, Mass.

Lepidoptera.—Wanted, *Plusia balluca*, *metallica* and *ampla;* also the Hydrœcias. Have some of the rarer eastern Noctuids for exchange.—Henry Bird, Rye, N. Y.

Coleoptera and **Hemiptera**, European and exotic, also postage stamps of Roumania, offered for American Hemiptera-Heteroptera unnamed.—A. L. Montandon, Strada Viilor filarete, Bucarest, Roumania.

Phryganidæ wanted; will exchange choice Coleoptera and Lepidoptera from Kansas, Colorado and New Mexico (Prof. F. H. Snow's collecting) for Caddice-flies, U. S. or exotic.—Vernon L. Kellogg, Univ. of Kansas, Lawrence, Kansas.

Lepidoptera.—Good exchange or cash given for specimens of *Nadata doubledayi* Pack. Also wanted any of the rarer Notodontidæ and Limacodidæ.—Harrison G. Dyar, 599 Broadway, New York City.

Coleoptera.—I wish to obtain Entomological literature in any language, especially that treating of Coleoptera and for works not in my possession will give good insects from the West and from Alaska, mostly Coleoptera.—H. F. Wickham, Iowa City, Iowa.

Lepidoptera.—I have for exchange *C. semidea*, *A. montanus*, *S. modesta* (imagos and pupæ), and other White Mountain material. The rarer Sphingidæ preferred.—R. Ottolengui, 115 Madison Ave., N. Y.

Lepidoptera (diurnal) of Iowa to exchange for species of same order not in my collect on.—Henry G. Willard, Grinnell, Iowa.

Coleoptera.—Price-lists wanted.—Dr. E. B. Stephens, Plymouth, Mass.

Cynipidæ.—Named or unnamed Cynipidæ wanted by purchase or exchange. Always accompany the flies with their galls when possible.—C. P. Gillette, Ft. Collins, Col.

Orthoptera.—For exchange: Mexican Lepidoptera, unmounted, for literature, in any language, on N. A. Orthoptera. Also Indiana Orthoptera for others from any part of N. A.—W. S. Blatchley, Terre Haute, Ind.

Orthoptera.—I desire to procure, by purchase, exchange, or for identification, specimens of the genus *Spharagemon* from all parts of the country.—Albert P. Morse, Wellesley College, Wellesley, Mass.

Lepidoptera.—Cocoons and pupæ of the rarer moths, *luna*, *imperialis*, *regalis*, *P. fraterna*, *P. pithecium*, etc.; also many fine set specimens; hybrids from *selene* et *luna*, *ceanothi* et *cecropia*, *Gloveri* et *cecropia*. List exchanged.—Emily L. Morton, Newburgh, N. Y. (New Windsor delivery).

Lepidoptera.—Prepared larvæ, live pupæ, Coleoptera and Reptiles from America desired in exchange for species of Europe.—A Voelschow, Schwerin in Mecklinburg, Germany.

Lepidoptera.—I wish to exchange large, sound pupæ of *Cecropia* and *Polyphemus* for pupæ or imagines of almost any other species of Lepidoptera.—James Tough, 234 S. Water Street, Chicago.

Lepidoptera.—American diurnals wanted. Will buy or exchange. Hesperidæ and Lycænidæ especially desired.—Henry Skinner, Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

Lepidoptera.—A few rare Indian Lepidoptera to exchange for rare species from the Northwest.—Levi W. Mengel, Reading, Pa.

Odonata.—Dragonflies. Species not in my collection wanted from all parts of the world. N. American species given in exchange, or named by special agreement.—P. P. Calvert, Acad. of Nat. Sciences, Phila., Pa.

Coleoptera and **Lepidoptera.**—I desire to exchange specimens with collectors in the South and West who wish to extend their collections; correspondence solicited.—F. W. Russell, M.D., Winchendon, Mass.

I am desirous of collecting in any of the Orders in Northwestern Ohio; write me.—N. Sager, Jr., Herring P. O., Allen Co., Ohio.

Diurnal Lepidoptera.—I will be pleased to correspond with collectors with view to exchanging Lepidoptera of the world. I usually have 2000 or 3000 mounted duplicates on hand, in perfect condition.—A. G. Weeks, Jr., 360 Washington St., Boston.

Correspondence and exchange of insects desired with young entomologists, especially in the Southern and Western States and Mexico.—Stewart N. Dunning, 43 Niles St., Hartford, Conn.

I desire to dispose of Japanese insects by sale or exchange; correspondence solicited. By permission, refer to Prof. C. V. Riley.—Otoji Takahashi, Tokio, Japan.

Coleoptera.—*Aegialites Fuchsii* Horn, Trans. Am. Ent. Soc. xx, p. 143, 1893. I offer this rare and interesting species in exchange for Coleoptera not in my coll. Address C. Fuchs, 212 Kearney St., San Francisco, Cal.

Lepidoptera.—I desire to obtain eggs or larvæ of *Eacles regalis* and *Sphinx modesta;* will exchange for other good material.—Hermann Aich, 43 Murray St., New York.

Lepidoptera.—I have a large number of duplicates which I offer for sale or exchange. Address G. Cleveland, 17 Elm St., Oneonta, N. Y.

Lepidoptera.—Hybrid cocoons of *Ceanothi* et *Cecropia* in exchange for rare, perfect specimens of Sphingidæ, Arctiidæ, Bombycidæ, Catocalæ and Diurni not in my collection.—Dr. R. E. Kunzé, 606 Third Ave., N. Y.

Lepidoptera.—I have on hand a large supply of duplicates which I wish to exchange for insects of the same order not in my collection. Correspondents especially desired from the southwestern and northwestern part of the U. S. Send list of duplicates to Leigh I. Holdredge, 27 Ford Ave., Oneonta, N. Y., U. S. A.

Lepidoptera.—Several thousand specimens taken in Utah during past Summer for exchange; *Parnasius, Chionobas, Theclas,* etc.; also good specimens from Illinois; all in papers.—A. J. Snyder, North Evanston, Ill.

Lepidoptera.—Wanted, cocoons of *regalis, imperialis, gloveri, io, cecropia, polyphemus, promethea* and others, as well as pupæ,—against Lepidoptera of all parts of the world.—Bernard Gerhard, 1520 Lafayette Avenue, St. Louis, Mo.

Lepidoptera.—Correspondents wanted on Pacific coast, or Colorado, with a view to exchange in Lepidoptera.—Oliver J. Staley, Marshall, Saline County, Mo.

Lepidoptera.—We wish to obtain, either by purchase or exchange, live larvæ or pupæ of *Ecpantheria scribonia* and imagos of *Erebus odora.*—Field Brothers, Milton, Mass.

Wanted.—Coleoptera and Lepidoptera from all sections. Will exchange works on Entomology, Zoology and Botany, and works relating to the languages of the N. A. Indian. Send for list. —Wm. D. Doan, Box, 377, Coatesville, Pa.

(Continued on third page of cover.)

Additional Exchange Notices.

Lepidoptera.—Rare exotic butterflies offered *for others.* Papilios: *caunus, hewitsonii, forbesi, iuda, govindra, læstrygonum, arijuna, peranthus, indicatus, ascolias, rhodifer, mynes, caledonia, ornith, brookiana* ♀, etc.—Letters to I. Cone, 273 Oakwood Blvd., Chicago, Ill.

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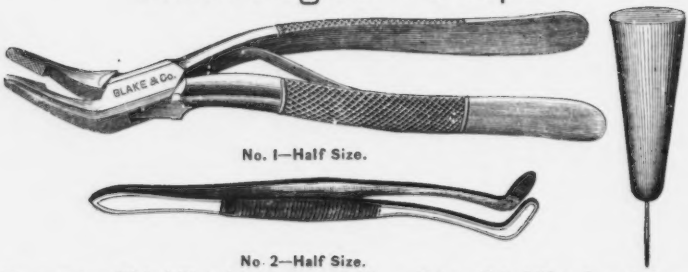

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